# *Some Like it Hot*: Hydration & Exercise in the Heat

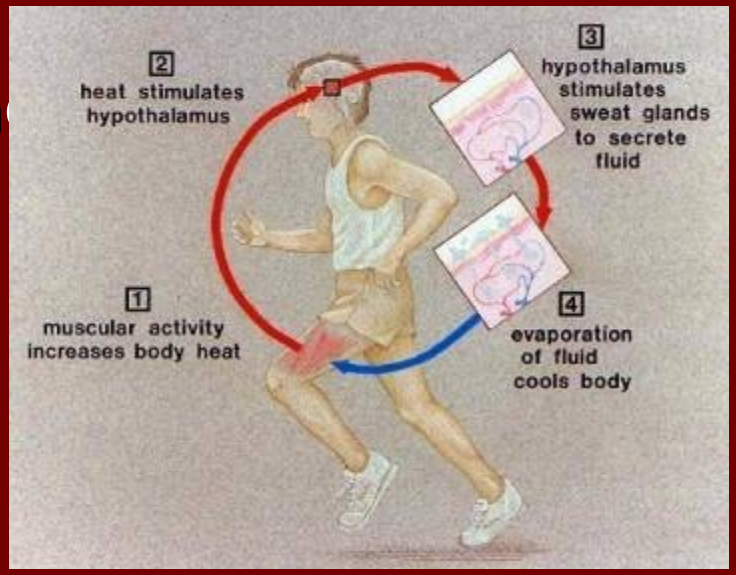
Semper Fit Health Promotion Presentation

# Overview

- Heating Up and Beating Down
  - Internal Source: Body Heat 101
  - Environmental Source: Heat & Humidi
- So What?
  - Common Heat Illnesses
- What You Can Do . . .
  - Acclimatize
  - Dress to Cool
  - Hydrate
- Bonus Facts & Tips
- Best Practices
- May Observances
- Questions?
- Points of Contact

# Body Heat 101

- Exercise produces heat
- To reduce heat, blood circulatin
  in our veins (venous blood) is
  brought to the skin's surface
- Sweat glands secrete water
  onto the skin
- When the H2O evaporates, the
  surfaced blood is cooled
- In favorable environmental conditions, these mechanisms will prevent body temp from rising more than about 2° – 3° F (even during heavy PT)



# Forecast: Heat & Humidity

- Hot, humid climates are the most stressful conditions in which to PT
  - In high humidity (>60%), sweat does not evaporate as quickly from the skin
  - As venous blood moves to the surface to be cooled, the amount of blood available to the muscles (including the heart muscle) decreases . . .
    - Extra stress on the heart & lungs
    - Increased heart rate

Relative humidity (%)

| Air temperature (°F) | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 | 95 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 110 | 136 | | | | | | | | | | | | |
| 108 | 130 | 137 | | | | | | | | | | | |
| 106 | 124 | 130 | 137 | | | | | | | | | | |
| 104 | 119 | 124 | 131 | 137 | | | | | | | | | |
| 102 | 114 | 119 | 124 | 130 | 137 | | | | | | | | |
| 100 | 109 | 114 | 118 | 124 | 129 | 136 | | | | | | | |
| 98 | 105 | 109 | 113 | 117 | 123 | 126 | 131 | | | | | | |
| 96 | 101 | 104 | 108 | 112 | 116 | 121 | 126 | 132 | | | | | |
| 94 | 97 | 100 | 102 | 106 | 108 | 114 | 119 | 124 | 129 | 136 | | | |
| 92 | 94 | 96 | 99 | 101 | 105 | 108 | 112 | 116 | 121 | 126 | 131 | | |
| 90 | 91 | 93 | 95 | 97 | 100 | 103 | 105 | 109 | 113 | 117 | 122 | 127 | 132 |
| 88 | 88 | 89 | 91 | 93 | 95 | 98 | 100 | 103 | 106 | 110 | 113 | 117 | 121 |
| 86 | 85 | 87 | 88 | 89 | 91 | 93 | 95 | 97 | 100 | 102 | 105 | 108 | 112 |
| 84 | 83 | 84 | 85 | 86 | 88 | 89 | 90 | 92 | 94 | 96 | 98 | 100 | 103 |
| 82 | 81 | 82 | 83 | 84 | 84 | 85 | 86 | 88 | 89 | 90 | 91 | 93 | 95 |
| 80 | 80 | 80 | 81 | 81 | 82 | 82 | 83 | 84 | 84 | 85 | 86 | 86 | 87 |

## Heat Index/Heat Disorders

| *Heat index* | *Possible heat disorders for people in higher risk groups* |
|---|---|
| **Extreme danger**<br>130°F or higher | Heatstroke/sunstroke highly likely with continued exposure. |
| **Danger**<br>105°F to 130°F | Sunstroke, heat cramps, or heat exhaustion likely, and heatstroke possible with prolonged exposure and/or physical activity. |
| **Extreme caution**<br>90°F to 105°F | Sunstroke, heat cramps, and heat exhaustion possible with prolonged exposure and/or physical activity. |
| **Caution**<br>80°F to 90°F | Fatigue possible with prolonged exposure and/or physical activity. |

# Additional Considerations

- Other conditions that can limit the ability to regulate temperature:
  - Old age* (> 65 yrs)
  - Youth* (0 – 4 yrs)
  - Obesity*
  - Fever*
  - Dehydration
  - Heart Disease
  - Mental Illness
  - Poor Circulation
  - Sunburn
  - Prescription Drug Use*
  - Alcohol Use

*Greatest Risk Factors

# Common Heat Illnesses: *Heat Rash*

- *Definition*
  - Skin irritation from excessive sweating during hot, humid conditions
- *Facts & Signs*
  - Looks like a red cluster of pimples or small blisters; more likely to occur on the neck and upper chest, in the groin, under breasts, and in elbow creases; most common in young children
- *Treatment*
  - Find a cooler, less humid environment
  - Dry the affected area
  - Dusting powder might provide some comfort

# Common Heat Illnesses: *Heat Cramps*

- *Definition*
  - Muscle pains or spasms that happen during heavy exercise
- *Facts & Causes*
  - Usually occur in the abdomen, arms, or legs; heavy sweating depletes the body's salt and moisture; cramps can also be a sign of heat exhaustion
- *Treatment*
  - Stop exercising
  - Rest in a cool place
  - Drink water, clear juice or a sports beverage
  - Continue to rest for a few hours after cramps subside (further exertion could lead to heat stroke / exhaustion)
  - Seek medical attention if cramps do not subside in one hour

# Common Heat Illnesses: *Heat Exhaustion*

- *Definition & Info*
  - An illness that can precede heatstroke
  - The most commonly diagnosed heat illness among athletes
- *Signs & Symptoms*
  - Weak, rapid pulse; low blood pressure; headache; nausea; dizziness; general weakness; paleness; cold, clammy skin; profuse sweating; elevated core body temp (>104° F or 40° C)
- *Treatment*
  - Stop exercising
  - Move to a cool, ventilated area
  - Lay down and elevate feet 12” – 18”
  - Give fluids (non-alcoholic / non-caffeinated)
  - Monitor temperature

# Common Heat Illnesses: *Heat Stroke*

- *Definition*
  - A life-threatening illness; body temp rises rapidly (within minutes)
- *Signs & Symptoms*
  - Hot, dry skin; bright red skin color; rapid, strong pulse; labored breathing; dizziness; nausea; confusion; loss of consciousness; elevated core body temp (>105° F or 41° C)
- *Treatment*
  - Stop exercising
  - Remove as much clothing as possible
  - Cool the body immediately in any way possible (wet towels, ice packs/baths, fan, alcohol rubs)
  - Give fluids (non-alcoholic / non-caffeinated)
  - Transport to an Emergency Room immediately

# Other Heat-Related Illnesses

- Heat Edema
  - *Definition*
    - Swelling of ankles and feet
  - *Treatment*
    - Elevate legs and feet
- Heat Syncope*
  - *Definition*
    - Sudden dizziness or fainting
    - One of the most common heat illnesses
    - Generally occurs during the 1st 3 – 5 days of heat exposure

**Heart medications such as beta blockers can increase the risk of this illness*

  - *Treatment*
    - Elevate legs and feet
    - Rest in a cool location

# Acclimatize

- "Heat acclimatization" = Improved tolerance to heat
- Acclimatizing can take up 14 days
- Acclimatization can be:
  - *Passive* (just moving to or visiting a hot climate) &/or
  - *Active* (purposely training in the heat)
- Good news . . . Heat acclimatization can improve an individual's tolerance to heat as shown in:
  - Decreased incidences or severity of heat illnesses
  - Improved fitness levels (reduced cardio, thermal, and metabolic strain)
  - Improved ability to regulate core temperature and dissipate heat

# Dress to Cool

- Color
  - Dark colors absorb heat
  - Light colors reflect heat
- Fabric
  - Choose breathable, light fabrics
  - Cotton “breathes”
  - Most synthetic materials retain heat
- Amount
  - Wear as little clothing as possible in consideration of the sport
  - If pads, helmets, or other protective gear are worn, be aware that they might increase the risk of heat illnesses

# Hydrate

- Weigh in before & after P
  to determine fluid
  replacement needs

- Drink water before, during and after
  - 20 min before → 7 – 10 oz
  - Every 15 min during → 8 – 10 oz
  - Within 2 hrs after → 24 oz for every lb lost

# Hydrate

- For PT lasting longer than 90 minutes
  - 8 – 10 oz sports drink can be consumed to replace electrolytes lost through sweat
- Cold water & fluids are recommended for vigorous PT
  - Helps regulate core body temp
  - Cold water (41° F) is absorbed faster from stomach than warm

# Bonus Facts & Tips

- Skin temp is not a good indicator of core temp
- Pace yourself
- If your heart is pounding or you are gasping for breath, stop all activity and find a cooler environment *ASAP*
- If possible, avoid PT during the hottest part of the day (usually between 1000 & 1500 during the summer)
- Apply sunscreen 30 minutes before going outdoors and reapply according to package directions
  - Sunburns:
    - Affect the body's cooling mechanism
    - Cause loss of body fluids
    - Are painful and damaging to the skin

# Best Practices

- Check the Weather (with Heat Index)
- Allow Sufficient Time to Acclimatize (1 – 2 Weeks)
- Wear Light-Colored, Loose-Fitting, Breathable Clothing
- Stay Hydrated
- Reduce Gear if possible & Find Shade for Rest Periods
- Monitor Yourself & Others
- Take Action at the 1st Signs of Illness
- Eat Regularly
  - 5 – 6 small meals throughout the day
  - fruits & vegetables contain water
- Wear Sunscreen

# May Observances

- National Employee Health & Fitness Day
- National Physical Fitness & Sports Month
- Melanoma / Skin Cancer Detection & Prevention Month

# Questions?

# Points of Contact

**MARFORRES - Marine Corps Community Services**
**Semper Fit Program**
**2000 Opelousas Avenue, New Orleans, LA 70146**
**(504) 697-9768 (Fax)**
**http://www.marines.mil/unit/marforres/MFRHQ/MCCS/SemperFit/Health.aspx**

**http://www.facebook.com/pages/New-Orleans-LA/MCCSSEMPER-FIT-MARFORRES/126284770729139**

mfr_semper_fit@usmc.mil

**Semper Fit Director**
**(504) 697-8121**

**Health Promotion Coordinator**
**(504) 697-9693**

**Semper Fit Coordinator**
**(504) 697-9691**

MCCS MARINE CORPS Community Services

UNITED STATES MARINE CORPS SEMPER FIT SPORTS, RECREATION & FITNESS